

### REMARKS

In response to the Office Action mailed May 26, 2009, Applicants provide the following. Upon entry of this Amendment, the claims have been amended without adding new matter. Claims 21-22 and 25-41 have been amended. Claims 23-24 and 42-43 have been cancelled without prejudice. Reconsideration of claims 21-22 and 25-41 in view of the amendments above and remarks below is respectfully requested.

In the Office Action, claims 21-43 were rejected under 35 U.S.C. § 112, first paragraph as failing to comply with the written description requirement and as being indefinite. Claims 21-23 and 26-43 were rejected under § 103(a) as being obvious over U.S. Patent No. 5,592,832 issued to Herron et al. Claims 24-25 were found to be allowable if rewritten so as not to depend on a rejected base claim.

By the way of this amendment, Applicants have made a diligent effort to place the claims in condition for allowance. However, should there remain any outstanding issues, it is respectfully requested that the Examiner telephone the undersigned at (312) 577-7000 so that such issues may be resolved as expeditiously as possible.

### Amendments to the Claims

Claim 21 has been amended herein to include the subject matter of allowable claim 24 and claim 23. Accordingly, claims 23-24 have been cancelled. In addition, claim 25 has been amended to include the subject matter of independent claim 21 and dependent claim 23 so that allowable claim 25 is not dependent on a rejected base claim.

In addition, the terms "without transferring mass between the first and second volumes" have been removed from claim 21 to address the Examiner's § 112 objection. Nonetheless, support for this language may be found throughout the application. For example, "a heat integrated distillation column, consists of two separated volumes along the length of the column wherein sufficient heat transfer is provided between the volumes." Para. [0005]. Further, in paragraph [0006] the heat integrated distillation column is outlined as "comprising a cylindrical shell having an upper and a lower end and at least one first inner volume and at least one second inner volume in the shell, being in heat exchanging contact with each other through a wall separating the volumes." Further, the "providing means having heat exchanging capacity

extending through the said wall from said at least one first volume into said at least one second volume, whereby the inside of the heat exchange means is in open connection with the said first volume. Of course the *heat exchange means have no connection for mass transfer to the other (second) volume.*" Para. [0006] (as filed, with italics added). Thus, the specification, as filed, does provide support for not transferring mass between the two volumes in the outer shell. Applicants have made minor amendments to this paragraph in this amendment to increase readability.

The Office Action cites to paragraph [0012] for support for the contention that must transfer does occur. However, that paragraph is related to transferring of mass within the volumes, not between the two volumes. Paragraph [0012] confirms that the mass transfer occurs between two distillation sections within a single volume. Nonetheless, in an effort to advance prosecution, the Applicants have removed this limitation from claim 21 despite the support for the language throughout the specification and, in particular, in paragraph [0006] as discussed above.

Claims 22 and 26-40 have been amended to depend on an allowable claim. In addition, claims 38 and 40 have been amended to address the Examiner's concern with respect to Markush groups. Claim 33 has been amended to address an antecedent basis issue.

In regard to the contention in the Office Action that claim 30 does not have support in the specification, Applicants' refer to Fig. 9 and paragraph [0047]. Fig. 9 illustrates the heat integrated distillation column being divided into 2 volumes by straight dividing walls. Further, the detailed description states "a single cylindrical shell column is separated by a dividing wall 270 on each tray 210, 220 such that two semi-cylindrical volumes 2100, 2200 are created." Para. [0047].

Claim 42 has been amended herein to clarify that the method for distillation comprises "providing a heat integration distillation column having an outer shell with a first and a second volume in heat exchanging contact with one another through a dividing wall; providing at least one heat exchanger to further exchange heat between the first and second volumes...providing a plurality of trays with downcomers...and moving contents through the heat exchanger to facilitate further heat transfer from the fluidly connected first or second volume to the other volume without transferring mass between the first volume and the second volume." Support for this amendment can be found throughout the application and, in particular, in throughout

the claims as filed, the drawings, and the detailed description, including paragraphs [0007] through [00225] and paragraphs [0038] through [0040] from the published applications. Applicants submit that no new matter has been added with these amendments. Further, the Applicants submit that the amended claims recited subject matter that is novel and non-obvious in view of the prior art of record.

#### Amendments to the Specification

Paragraphs [0003], [0004], [0006], and [0012] have been amended herein to address minor grammatical errors. No new matter is being submitted with these amendments.

#### Allowable Subject Matter

Claims 24 and 25 were objected to as being dependent upon a rejected base claims, but the Examiner noted that these claims would be allowable if rewritten in independent form. As described above, Applicants have made appropriate amendments to pursue the timely issuance of this allowable subject matter. Further, claims 22 and 26-40 have been amended to depend from these allowable claims or cancelled. Claim 41 has been amended to recite a method that includes the "wherein the heat exchanger is positioned at the downcomer of one of the plurality of trays or between the plurality of trays; and moving contents through the heat exchanger to facilitate further heat transfer from the fluidly connected first or second volume to the other volume without transferring mass between the first volume and the second volume." Thus, claim 41 has been amended to recite the subject matter of allowable claims 24 and claims 25. The amendment of claims 21-23 and 25-41, and the cancellation of claims 42-43, should not represent a surrender of any subject matter and Applicants specifically preserve the right to present these claims in their originally filed form in a continuing application.

#### Conclusion

For all of the reasons mentioned above, the Applicants respectfully submit that the above amendments and remarks place the pending claims in a condition for allowance. Therefore, a Notice of Allowance is respectfully requested.

The Commissioner is hereby authorized to charge any additional fees which may be required in this application under 37 C.F.R. §§1.16-1.17 during its entire pendency or credit any overpayment, to Deposit Account No. 06-1135 regarding our order number 7389/84086.

Respectfully submitted,

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